

The Nesting of the Australian Pelican (*Pelicanus conspicillatus*)

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Owing to the gradual dessication of the interior the Darling River does not receive any water on its western side from the 30th degree of latitude, where the Warrego River enters it, near Bourke, until it joins the Murray River at about the 34th parallel.

The waters of the Paroo find their way to the Darling only in years of exceptional rainfall, usually losing themselves in vast flats and lignum (*Muehlenbeckia Cunninghamsi*) swamps before reaching it. The Bulloo waters only find their way over the Queensland border for a short distance to be sopped up in similar areas, and most of the creeks that take their origin from the eastern side of the Barrier Range share the same fate.

It follows, then, that the Darling depends for its periodic floodings, which vary greatly in extent, on the rains which fall in South-eastern Queensland, and North-eastern New South Wales. The river itself has a broad and deep channel, with its banks bordered by fine old red gums (*Eucalyptus rostrata*), an area of varying extent on either side subject to inundation and supporting an arboretum of box (*E. bicolor* mostly) and *Acacia stenophylla*. Connected with this are old channels of the river, and a system of lakes. One of these old channels, known as the Talyawalka, courses down on the eastern side at distances of from 5 to 40 miles out from the river itself. Passing Wilcannia at about 10 miles out, it soon increases this distance, filling a series of lakes in succession, such as Teryawynia, Victoria, Brommeys, Ratcatchers and Boolaboolka Lakes, and then finding its way by one or more channels into the river again.

On the western side a channel runs out just below the town of Menindie, and immediately fills a large depressed area of about 76,000 acres, known to the aboriginal inhabitants as Minandichi, but now called Lake Menindie. This is connected by a tortuous channel, the Wooriarara Creek, about 12 miles in length, with Cawndilla Lake, which has an area of about 160,000 acres. Both lakes and creek are enclosed by sandhills, from which they are separated by box flats. The centre portion bordering the creek and more depressed than the rest, is known as Mortonboolka Swamp, as it is more often under water than the rest of the flats, only high floods covering these and reaching to the foot of the sandhills. When the river falls, most of this water runs out again, and serves to keep up the level of the river for several months below where the creek enters it.



A portion of the nesting island of the Australian Pelican, Cawndilla Lake,
Darling River, N.S.W.

Photo. by Dr. W. MacGillivray, R.A.O.U.

The Darling is usually a running stream, but may in very dry times be reduced to a series of waterholes. Small floods, which do not rise to the top of the channel, usually occur every two or three years. Floods which overflow the banks and fill the lower flats to a greater or less extent occur at longer intervals. Exceptional floods which cover all the flats and run the outlying channels to the filling of the larger lakes only happen once or twice in an ordinary lifetime. Such large floods took place in 1864, 1870, 1890 and in 1921, and it is of the nesting of the Pelican (*Pelicanus conspicillatus*) during the last big flood that these notes are mostly concerned.

Boolaboolka Lake, the terminal one of the series of lakes filled by the Talyawalka, has not been filled since 1890. Last year water poured into it for three months, but did not fill it, in spite of the fact that most of the others had been filled twelve months before.

Whenever a flood of sufficient extent to overflow the banks and to isolate numbers of trees and lignum bushes occurs, waterfowl of many kinds start to nest, Swans, Ducks, Coots, and Waterhens being the earliest, with wading birds, such as Herons, Spoonbills, and Ibises. Pelicans, Darters, and Cormorants do not nest unless other special conditions obtain, and these have relation to food supply and protection.

When the river is low or reduced to a series of holes, the smaller and naturally more prolific of its fish fauna have their numbers kept in check by the Cod, from which dominant species they have little or no chance of escape. Their ova and small fry are also more easily preyed upon by crayfish, birds and turtle.

When, however, the waters spread out over large flats and lake areas, these adverse conditions are removed, and these species increase enormously, and one finds that Pelicans, Darters and Cormorants do not attempt to nest until these areas have been filled for twelve months or more, and the fish have been given time to multiply.

The Cormorants and Darters choose trees standing in water, on which to place their nests; the bulkier Pelican, however, requires an island where its eggs may be incubated and its young reared free from molestation by marauding animals for a period of from 5 to 6 months or more. At Boolaboolka these conditions have not obtained since 1894, when the last breeding took place. Last year it was the last lake to receive the flood waters and then not in sufficient amount to form the required island.

The last nesting of Pelicans in this district was at Cawndilla in 1904.

At Teryawynia Black Swans (*Chenopsis atrata*) nested freely on some of the islands during the winter and early spring of 1921, but the Pelicans took charge of several islands isolated by the flood waters at the end of the year, and have had possession ever since.

Four species of Cormorant—*Phalacrocorax carbo*, *P. ater*, *P. varius*, and *Microcarbo melanoleucus*—have also nested freely on Menindie, Cawndilla, and Teryawynia Lakes right through the spring, summer and autumn months.

I have been able to make frequent excursions on to the Menindie and Cawndilla Lake areas, owing to the courtesy shown and assistance rendered me by Mr. Allison, the manager of the Kinchega holding, on which the lakes are situated. The management is centred at Kars Station, about 40 miles out from Broken Hill on the way to Menindie.

An account of a visit to these lakes in January last, supplemented by observations made on previous visits in the spring and summer and on several occasions since will serve to give an idea of the bird life to be met with.

On the 28th January last, accompanied by Dr. Finlayson and my son, Ian, I started out for Kars station at 5.30 a.m. At about twenty miles out the road descends from the Barrier Range, and runs through open saltbush plains to cross Stephens Creek, a few miles below where Sturt first camped on it on his memorable expedition into the interior in 1844.

Near the turn-off to the station we flushed three fine Bustards from a tract of country where a little green herbage has resulted from an errant summer thunderstorm.

These birds are only odd ones, this species not having appeared here in numbers since 1911, when the interior and Western Queensland were devastated by a drought and better conditions obtained hereabouts.

Arriving at Kars in time for breakfast, we found the manager, overseer and a boy as cook ready to accompany us to the lakes.

Another thirty miles, at first through scrub consisting principally of Mulga (*Acacia aneura*) and Neelia (*Acacia loderi*), amongst which are interspersed "Dead finish" (*Acacia tetragonophylla*), Bullock Bush (*Heterodendron oleofolium*), Sandalwood (*Myoporum platycarpum*), Leopard Trees (*Flindersia maculata*), a few Quandongs (*Fusanpis acuminatus*), and Black Oaks (*Casuarina lepidophloia*) out on to spear-grass country, through a few dry cane-grass swamps, and over the sand rises on to the box flats bordering the lake area and from which the flood waters have recently receded to the level of the creek banks, we pulled up near where the creek comes out from Menindie Lake.

Here we leave our car; the station Ford trolley loads all our gear, and in charge of Mr. O'Halloran, the overseer, and the cook goes on to make a camp near to where the creek connects with Cawndilla Lake.

The rest of us take to the station boat, which is kept at a boundary rider's hut on the creek, and row up towards Cawndilla. Keeping to the stream for half a mile, we enter Mortonboolka Swamp to cut off a large bend of the creek and to investigate the bird life of the swamp. A few Ducks are on the water,



Nest and Young of Darter, Cawndilla Lake, Darling River, N.S.W.

Photo. by Dr W. MacGillivray, R.A.O.U.

mostly Pink Ears (*Malacorhynchus membranaceus*), with broods of young of various stages of growth; this species has been nesting since early spring. Here the nests were mostly in hollows of trees usually at a low elevation from 1 to 6 feet from the water, occasionally as much as 20 feet. The clutches are always moderate, from five to eight, and the eggs well enveloped in down. Teal (*Virago gibberifrons*) are next in point of numbers, and have also young of all ages. Their nests range to a greater elevation than those of the Pink Ears, and the clutches are slightly larger, rarely more than ten or twelve.

A few Grey Ducks (*Anas superciliosa*) and Australian White-eyes (*Nyroca australis*) were also noted. Maned Geese were more plentiful than earlier in the summer, and in flocks the loud "Gnaroo" call of the female more frequently heard than the subdued tones of the ganders.

Early in the spring, Dr. Chenery and I met with a number of Freckled Ducks (*Stictonetta naevosa*) paired for breeding purposes on Menindie Lake. These birds were wonderfully tame, swimming round about our boat without showing any fear and allowing a close inspection. The male is larger than the female, and further distinguished by a crimson patch across the base of the mandible. Both sexes have a small top-knot or knob on the head. They prefer to nest in lignum or cane grass, and left Menindie Lake to nest elsewhere when the rising waters submerged all the lignum.

The White-eyed Duck also prefers lignum or cane grass to nest in, and usually lays larger clutches than any other Duck. Dr. Chenery and I found them nesting in the flood waters of Cooper's Creek in 1920 with large clutches of 15 to 18 eggs: we saw one young brood of 25, and several of 15 to 18 with their parents. Since then Dr. Chenery has verified this observation on some swamps on the Darling.

Continuing through the swamp we flush at intervals White-necked Herons (*Notophoxyx pacifica*) and White-faced Herons (Blue) (*N. nova-hollandia*) from nests containing either eggs or young birds. All through the swamp and along the creek Darters (*Anhinga nova-hollandia*) have their bulky stick nests draped with overhanging gum leaves placed on horizontal green or dead limbs. Most of these nests contain from three to five young birds. Naked when hatched, they soon acquire a covering of creamy white down. Older birds sitting bolt upright in their nest with wing and tail feathers sprouting are still clothed in creamy down with head and neck fawn-coloured. These larger young are suspicious of us, and flop out of their nests into the water, where they disappear to put up head and neck only, about 30 yards away, and disappear again immediately. When all danger is passed, they climb out on some sloping tree trunk or snag, where their wants are attended to by the parents; several young birds were seen by us in such situations. The old birds are on every dead tree or snag sunning themselves with out-

stretched wings or curiously eyeing us, and readily take to flight. They leave their perch rocking behind them from the impetus of their jump-off. The sexes share in the task of incubation, as we flushed both repeatedly from nests.

Wending our way through the swamp, we espy a Great Crested Grebe (*Podiceps cristatus*) swimming off in its stately way. Its nest is floating, and anchored to a clump of lignum; no eggs are visible till we remove the ample covering of water weeds for photographic purposes. The nest was about a foot in diameter, with an egg-cavity of 6 inches, and the highest part of the nest 4 inches above water level. It contained four eggs.

Numbers of Nankeen Night Herons (*Nycticorax caledonicus*), mostly adult birds, with a few dark ruddy-brown or spotted immature ones were disturbed from their camping places in the denser foliated trees. White Egrets (*Egretta alba*) were perched on trees or searching the shallower spots.

The nests of all these water birds that build in trees, conspicuous when first constructed of dark-coloured twigs and green or dry branchlets and leaves, are soon so whitewashed by the excreta of the birds as to become almost invisible in the bright sunlight.

Pelicans begin now to pass overhead in larger numbers, the bigger flocks flying in the V-shaped formation common to so many water birds, the apex of the letter being in advance, and the limbs altering in length with changes in the direction of flight of the flock. The bird at the apex is in this way frequently changed.

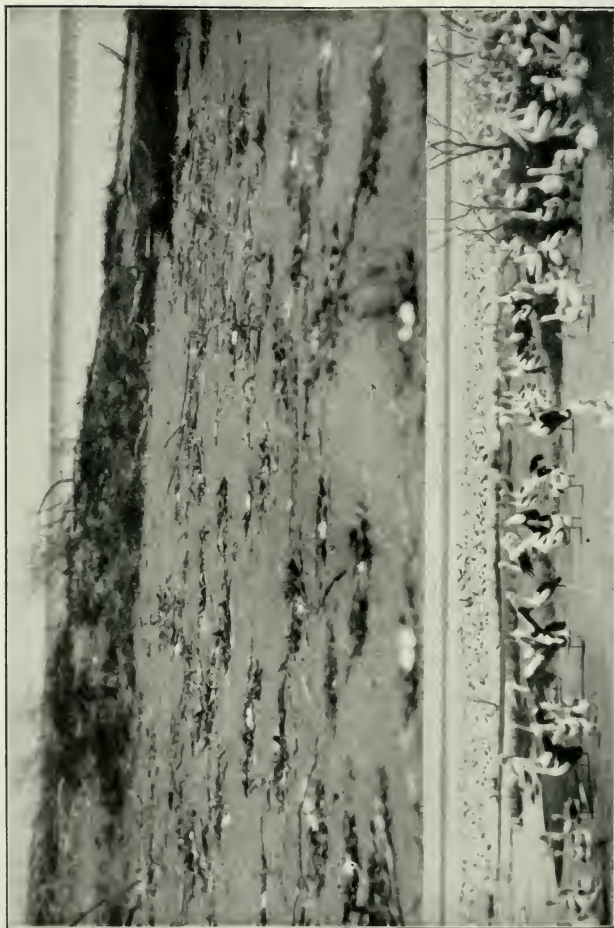
The Pied Cormorant (*P. varius*), the Little Pied (*Microcarbo melanoleucus*), and the Little Black (*P. ater*) were quite numerous, either in the water, perched on some point of vantage, or flying overhead; the last-named being in point of numbers far ahead of the other two. The large black Cormorant (*P. carbo*) was more numerous in Menindie Lake, where it was nesting.

Along the shallow margin and on the numerous small islets formed by the falling waters are Red-Kneed Dotterel (*Erythrogonys cinctus*) and fewer numbers of the Black-fronted species (*Charadrius melanops*).

Near our destination for the day, we came across a small rookery of the Little Black Cormorant (*P. ater*) occupying two or three trees on the margin of an island in the creek; most of these nests contained young birds.

After our eight-mile pull, we welcomed the camp, where a meal awaited our arrival. We are soon in bed, and go off to sleep listening to the churring calls of the Owlet Nightjars (*Egotheles cristata*) as they hawk for insects amongst the trees, and the harsher notes of the Night-Herons fishing along the creek.

We are all astir at daylight, and disturb a flotilla of Pelicans that had been busy cornering a shoal of fish in the creek by the camp. Numbers of Water Hens (*Microtribonyx ventralis*) were



Nesting Pelicans. Upper—Nests with eggs. Lower—Young and old birds on land and in the water.

along the shore or feeding out from it on the green herbage. When thus engaged the tail is carried in a horizontal position, but when alarmed and on the alert or running, it is held erect, giving the bird the appearance of a bantam hen.

A White Ibis (*Threskiornis molucca*) was busily engaged stirring the shallow water with open bill, going back and forward and from side to side fossicking amongst decaying branches or under logs and making occasional rushes when something which his efforts had disturbed tried to escape.

Coots (*Fulica atra*) are plentiful on the water where they are thoroughly at home or walking along the edge in their clumsily erect fashion in marked contrast with the more active and graceful Water Hen (*Microtribonyx ventralis*). Galahs (*Cacatua roseicapilla*) are numerous, and there are odd pairs of Sulphur-Crested Cockatoos (*C. galerita*) in the trees. Greenies (*Meliphaga penicillata*) busily searching the leaves and branchlets for food are in numbers. On the previous day we had seen a pair feeding young in an almost invisible nest pendent in a gum branchlet near the hut on the creek. Brown Tree-Creepers (*Climacteris picumna*) run up and round the trunks of the box trees, the rough bark making their progress easy and supplying a meal from the insects and other creatures hidden in its crevices.

After breakfast all but the cook take to the boat and proceed upstream towards Cawndilla Lake. We soon come to a small heronry of Egrets (*Egretta alba*) that we had examined a month previously. Most of the nests now contain young birds. The old birds fly anxiously around, uttering their harsh croakings as we proceed to a closer view. The nests are built wholly of sticks, and average about 1 foot in diameter with a depth of 6 inches, some being more compactly and substantially built than others. Further on we again disturb Night-Herons from the trees in numbers, and every few yards either Blue (White-faced) Herons, Spoonbills or Darters from their nests, and flocks or broods of Ducks from the water. We come to where the creek blends with the water of Cawndilla Lake. A fair wind is blowing, and we can see and hear the waves breaking on the shores and surface of the lake. The trees bordering the creek thin out, and we land on a small island off the right bank, Mr. Allison remaining to bale the boat, whilst the rest of the party wade out in the shallow water to examine some scattered box trees. Two Darters' nests are first met with, one containing five large downy young standing bolt upright on the nest, the other silhouetted against the sky shows the old bird sitting on it. Our efforts to photograph these are frustrated by the large young birds flopping into the water, and the old bird flying off before we are near enough for our purpose. The second nest contained newly hatched young as yet naked. Several other trees of this group support nests of the Little Black Cormorant.

On our return to the boat, we are informed that many of these birds have been flying on along the creek carrying sticks in their bills.

We soon come to their nesting trees, several large red gums being covered with nests. Many birds are busily constructing their nests; other nests contain eggs at all stages of incubation or young from the newly hatched to fully feathered birds. In this colony were a few nests of the Pied and of the Little Pied Cormorant.

About 100 yards further on a group of trees is occupied by nesting Egrets, mostly *Egretta alba*, with a few *E. garzetta*. The larger nests of *E. alba* contain three to four eggs, occasional ones five; some only one or two, and many nests are incomplete. The nests of the Little Egret were higher up in the trees, and were not examined. The birds returned to the trees whilst we were underneath or flew round above, or made uneasy short flights from tree to tree uttering their harsh croakings.

By our binoculars we made out a host of Pelicans about a mile and a half out towards the other shore, where an island was gradually being formed by the subsidence of the waters. We start over as the wind has fallen, and the surface of the lake moderating. We pass more Cormorant trees, the three last being covered with the nests of the Pied Cormorant, with a fewer number of those of the Little Black. These nests contained eggs and young at all stages. The egg clutches for both species consisted of from three to five eggs, the three clutches being mostly incomplete or broken. The water to our left and right was occupied by Ducks, Coots and Swans. Over in the shallow water near the shore are hundreds of Avocets (*Recurvirostra nova-hollandia*). Along the water line Red-capped and Black-fronted Dottrels are feeding, and on the shore are hundreds of Water-Hens (*Microtribonyx centralis*).

On nearing the Pelican island, we see that it is thickly covered with these great birds, whilst the water on either side is occupied by large flotillas of them. A long narrow bank running out from the centre of the island towards the centre of the lake for about quarter of a mile was also closely packed with them.

The island itself was narrow and roughly crescentic in shape, about 30 yards in width, and nearly one-third of a mile in length. The nesting birds did not attempt to leave the island till we were quite near, and then only those occupying the end near our landing place left. When, however, we advanced along the island, the air was soon full of birds, but those on the water in several large flocks were swimming backwards and forwards or making out from the islands, the flocks passing one another, but the individuals of each flock all acting in unison.

When we examined the nests we found that they were placed about one yard apart, and occupied the whole island from shore to shore, the more recent being near the margin on ground from which the water had only recently receded. Many of the new



A Pelican's Nest with a clutch of three eggs, Cawndilla Lake, Darling River, N.S.W.
Photo. by Dr. W. MacGillivray, R.A.O.U.

nests contained only the first egg, and were merely depressions scraped in the sandy soil; a number contained no egg at all. These scraped-out depressions were about 12 inches in diameter, and 4 to 6 inches in depth in the centre. The first egg was laid in this, and the nesting material was gathered as incubation proceeded (usually from whatever material was close at hand).

This consisted merely of sticks of dead tobacco bush (*Nicotiana glauca*); the hairy rhizomes of the rushes that grow on the island, water-weed dragged up from the water, feathers and even an occasional dead and dried Water-Hen were commandeered for the purpose. Some of the birds had plucked and carried green branchlets from the three or four red gums (*Eucalyptus rostrata*) that graced the island.

Some of the nests were quite imposing structures, and others showed that they were owned by careless and slovenly individuals; a few sticks only sufficing to encircle the original scraping. The larger nests when complete were from 18 to 20 inches in diameter with an egg-cavity 12 inches in diameter.

By far the greater number of nests contained two eggs, from 5 per cent. to 7 per cent. contained clutches of three, and occasional ones four. Most of the eggs were at this time fresh, or at an early stage of incubation. Only on the highest part of the island, which had been uncovered about six weeks previously, were there any hatching eggs, and none of these had been hatched for more than a day.

These newly hatched young were naked except for an indication of whitish down across the lower dorsal and femoral regions. The skin is of a fleshy-pink colour, with a salmon-pink gape, with legs and beak fleshy-pink. They had their eyes open before they were free from the shell. The irides were either brown or silvery white, and the pouch was well developed. These small young uttered a little barking chirp.

Alongside many of the nests were small heaps of disgorged fish, mostly Murray or Macquarie perch, varying in length from one to six inches. Some of the heaps contained as many as 75 fishes, and others any number between that and a dozen. Some consisted of fish in size and appearance like Whitebait, and partly digested; these were evidently intended for the newly hatched chicks. Some of these latter were capable of helping themselves from the heaps, and were constantly making attempts to swallow their nest mate's beak or stumpy wings.

I visited this island again on the 12th February, on the 4th March, and the 9th of April, and another nesting place on Teryawynia Lake on the 11th June. On my second visit fourteen days later, the island had enlarged considerably, and the nesting Pelicans had kept pace with it; many new nests on the damp sand were either being just scraped out or contained one egg only.

Many more eggs had hatched out; several of the three clutches had brought out all three, and the earlier nests had been built up with more material. There was little or no disparity in size

between the young in the same nest, leading one to infer that the eggs of a clutch were laid on successive days.

The young birds hatched on the 29th January had now, a fortnight later, grown to the size of large domestic fowls, and had the whole of the upper surface covered with very short white down up to the occiput, and their skin had become whitish in colour.

These birds were beginning to leave their nests and to huddle together in small lots of six or seven, and to waddle away on their tarso-metatarsus when approached, uttering protesting harsh barking or grunting cries.

The adult birds rarely call at all; only on rare occasions does one hear a flying bird give out a hoarse grunt.

The young were now in sufficient numbers to show a good deal of variation in colour of the bill, face and irides. Typical young have the soft parts of the face like the rest of the body, a fairly bright fleshy-pink becoming dull white as they grow older, the iris is dark brown, but occasional birds of this type have silvery-white irides. A number have the face, bill and space round the eye more or less black or blackish brown, and with these the irides may be either brown or silvery-white also.

The masses of disgorged fish have increased greatly in number and some larger ones up to 8 or 10 inches in length are amongst them.

The adult birds do not carry fish in the pouch, which is only used for purposes of capture. All fish is brought from the fishing ground in the crop. When the adult bird is flying or walking or swimming, the pouch is always tucked up; only when standing idly on the land is it relaxed; it may be seen in young of all ages and adults flapping with the respiratory movements.

The young feed by putting head and neck down the parent's throat by the angle of the bill, and helping themselves from the contents of the crop, which are regularly regurgitated up to them by the parent. They are, however, even at earliest age capable of helping themselves from the heaps of small fish left on the nest. In stretching up their necks and heads as though soliciting food or protesting at our intrusion, they dilate the rami of the mandible and so widen the opening of the pouch. They have also the habit common to the young of many water birds of disgorging their stomach contents by way of a peace offering.

Several Silver Gulls (*Larus nova-hollandia*) were about the island on the look-out for a broken egg or a weakly or unprotected young one, and a few Ravens (*Corvus coronoides*) had found their way over from the adjacent mainland.

Many Gull-billed Terns (*Gelochelidon nilotica*) and Marsh or Whiskered Terns (*Chlidonias leucoparvia*) were hawking over the water or perched on a small bank out from the island. Caspian Terns (*Hydroprogne caspia*) frequent these inland waters in odd pairs, as I have identified them at close quarters and handled shot specimens.



Young Pelicans and food, Cawndilla Lake, Darling River, N.S.W.

Photo. by Dr. W. MacGillivray, R.A.O.U.



Young Pelicans massing together. Cawndilla Lake, Darling River, N.S.W.

Leaving the island we row back past the Cormorant colonies, and find the heronry of Egrets had been extended since our last visit, as also that of the Little Black Cormorants. Numbers of the nests of the latter species were on small saplings bordering the creek, and the birds themselves were perched all over several dry trees.

It was soon after this that a White-breasted Sea Eagle (*Haliaeetus leucogaster*) flew across the stream in front of our boat. This is my first record of this species hereabouts, though Dr. Chenery has recorded it from the Murray River not far from Wentworth.

Three weeks later, I again visited the Pelicans. After camping on the creek, Mr. Allison and I were ferried across and walked along the margin of the lake, whilst the rest of our party proceeded by boat.

When opposite the island we sat down and listened to the continuous groaning noise coming from it, caused by the multitude of young birds calling in their harsh tones for food. The island was a scene of busy and ceaseless activity, old birds constantly arriving and departing from the mass of birds on the island, where there seemed to be little or no standing room left. The water on either side and for a distance out from the island swarmed with the birds. The sandbank extending out at right angles to the island had dried off, and was fully occupied. Several of the birds were perched on the red-gum trees.

The odours wafted to us by the breeze had heightened since our earlier visits, and the increased number of young birds here made the place a noisy one.

The older chicks, from four to five weeks old, were covered with short down, and showed dark sprouting feathers on the scapular tracts and over the humerus with the primaries just indicated.

These young were now massed in mobs of anything from 10 to 40 or 50. On being approached they waddled off together with unsteady gait, balancing themselves with their featherless wings, and tumbling over all obstacles in their efforts to escape in droves, or crowded together in a closely packed mass, in which each bird was making frantic efforts to get to the centre of the mass, as in a Rugby football scrum, or they are huddled all together at the water's edge, afraid as yet to take to the water, although they seem to recognise it as their safest refuge. Many have overcome this, and are swimming out either singly or in small and compact companies. The gregarious instinct seems to assert itself so soon as the chicks leave the nest. Many nests were still being found, and numbers of old nests that had been vacated by the earlier hatched young were reoccupied, and contained fresh clutches.

The long, narrow bank before mentioned had several commencing nests on it, and also two nests of the Black Swan, each containing six eggs.

When I visited the island again on the 9th April, it had dried off and enlarged considerably. It was thickly occupied by birds, with a few Ravens and Whistling Eagles (*Haliastur sphenurus*) prospecting it for tit-bits. The groaning of the young could be heard half a mile away, like the continuous murmur of surf breaking on a reef.

The old birds rose in a vast flock when we waded out. Many young birds were huddled together; the flocks larger than on our previous visits consisting of any number up to one hundred and more. The oldest young are now about two months old, with feathers sprouting all over their bodies with the dark scapulars and primaries showing well.

There were young at all stages, and all the old nests contained eggs again. These are not second clutches, but the nesting of birds that could not find room earlier. The old birds are fairly nervous, and do not allow of our approaching nearer than 10 yards without taking to flight, which is preceded by a short run and some vigorous flapping. They do not as a rule rise high, flying out and settling on the nearest water; they soon return to their nests.

There are, however, always a number in the air, some sailing round at a great height and others lower. Occasionally one half closes its wings and planes down to the water, but more often they come down gradually. Occasionally the old birds on the water would take alarm, and all rise together, filling the air with a rushing sound; they rarely rise high and soon settle again. There are many young birds with the old ones out on the water.

On the 10th June, being anxious to compare the breeding places established by the Pelicans on Teryawynia Lake with the one on Cawndilla, I set out *per motor* with three companions. We crossed the Darling at Menindie, being ferried over on a punt; took the up-river track to Henley Station, where the manager, Mr. MacDonald, put us on the road to Teryawynia, which is an out-station on a lake filled by the flood waters that come down the Talyawalka, and about 40 miles out from the Darling.

Our road took us through box flats, open grass lands and a little scrub; skirted a fine tree-bordered lake, whose surface was covered with Duck, Swan and other water birds.

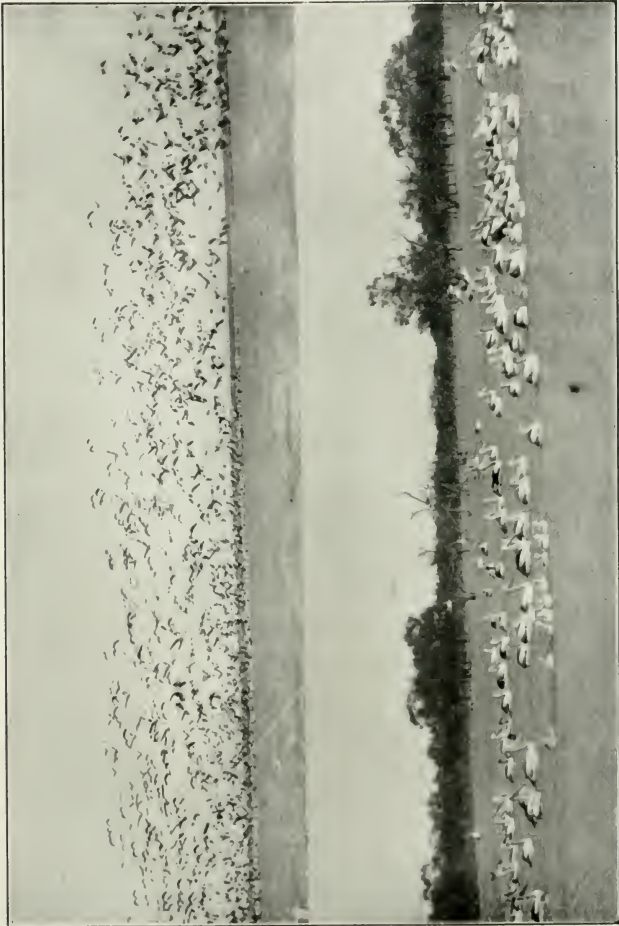
Several Kangaroos (*Macropus rufus*) were seen, and a few mobs of Emus, mostly last year's broods. We disturbed two flocks of Black Cockatoos (*Calyptorhynchus banksii*) that were feeding on the plains. These birds seem capable of picking up the smallest seeds from the ground, as I have found their crops full of seed no larger than the smallest grains of gunpowder.

Red-backed Parrots (*Psephotus haematonotus*) were numerous, and in flocks; these birds keep to the river country, and are never seen out back where their place is taken by the Many-colored Parrots (*P. varius*). A few White Cockatoos (*Cacatua galerita*) in small flocks were seen, and numerous large flocks of



Young Pelican about four months old, Teryawynia Lake.

Photo. by Dr. W. MacGillivray, R.A.O.U.



Lower—Swimming out with young birds.

Upper—Rising from rookery.

Photo. by Dr. W. MacGillivray, R.A.O.U.

Galahs (*C. roscicapillus*) rise from their feeding places on the ground. Blue-bonnets (*Psephotus haematogaster*) and Ring-necks (*Barnardius barnardi*) are occasionally seen in small lots.

We arrived by dark at the station, which is picturesquely situated on a peninsula with the lake in front and on two sides of it. During the summer when the flood waters were at their height, the house was completely isolated.

On the following morning we set out for the Pelican's breeding ground, which consisted of several islands at the southern end of the lake, about eight miles by road from the house. On our way round we noted many waterfowl along the margin and on the lake. Cormorants of four species were numerous, and nesting had finished, but many trees were seen that bore evidence of having been utilised for that purpose. White-faced Herons (*Notophox noræ-hollandiæ*), Royal Spoonbills (*Platalea flavipes*), and White Egrets (*Egretta alba*) were in fair numbers in the shallow water. We disturbed a flock of about 100 Crested Pigeons (*Ocyphaps lophotes*) from the ground to light upon a dead tree, but they were too timid to allow of a close enough approach for photographic purposes.

We leave our motors and walk on to the first of the islands occupied by a number of old and young Pelicans. This has been made possible by the subsidence of the water, two of the principal islands having dried off to the mainland. All the birds old and young move off into the water as we near them. We, however, note great numbers on adjacent islands and on the water, but there are no small young left on the land. We make a detour to arrive dry-shod on the second of the islands. Here we find a number of young birds still in their nests, and other older birds huddled together in masses or waddling off to the water in droves. Numbers of young of from 3 to 4 months of age are on the water. Mr. Ker, the overseer, informed us that more than half of the birds had left.

We noticed the same variation in colouring of the face and irides as at Cawndilla. One young one attracted our attention particularly on account of the head and neck being wholly dark brown in colour. Our time was limited, so that we had to make our way back to the homestead for an early lunch, and make a start back. On our return journey a belated Song-Lark (*Cinchorhamphus cruralis*) was disturbed from the roadside, all its mates having left long since for northern parts. A pair of Stubble-Quail (*Coturnix pectoralis*) were sunning themselves on a bare patch, and crouched as the motor whizzed by. Three half-grown Emus ran up for a close view of the motor, and we pulled up and waited for them to come quite near enough to have their portraits taken. A few hundred yards on a flock of ten Emus evince a like curiosity, and a piece of bright tinfoil slowly waved in the sunlight serves to bring them within range of our cameras.

We again disturb the Red-tailed Black Cockatoo and numerous Galahs from their feeding grounds, halt at Pisant Lake, with its numerous Ducks and Swans, and arrive at Henly for afternoon tea. A thunderstorm had crossed our track back from Henly, making it heavy, but we make Menindie for tea and arrive home by midnight.

Late in May, there were still many young of all stages of development on the island in Cawndilla. All the earlier hatches of young being fully feathered on the 12th August, I paid a visit to this breeding place, and found that there was no longer an island, the lake having fallen considerably, so that one could walk dry-shod out to it. A few thousand birds, mostly fully developed young with their parents, were still on the island, but all could fly, and did not admit of a close approach, flying off or walking into the water and swimming out on to the lake.

Up till May very few young birds seemed to have died; it was remarked by all who had visited the place before that time. Now, however, the island showed a remarkable mortality of fully matured young birds, which had evidently occurred at about the one time, as all were at about the same stage of decomposition. Although there were many dead lying about singly all over the island, the greater number were heaped together in masses, giving one the idea that the severe frosts experienced early in July had killed numbers as they huddled together for warmth. As an alternative explanation, there is the possibility that the supply of food had given out, as the consumption of fish by anything from fifty to one hundred thousand birds for a period of about nine months would be a big drain on the resources of the lake.

These lakes have been draining back into the Darling ever since last December, and many fish are still passing into the river. At the outlet into the river a remarkable scene presents itself every day; numbers of Cormorants and Pelicans are congregated waiting for the fish that come down. The Cormorants dive and capture the fish, but have to come to the surface to turn and swallow the fish head first, and the Pelican, who cannot dive, awaits this moment, and makes a grab for the fish. It often gets it, and sometimes includes the Cormorant's head or beak, which is naturally resented, and leads to a struggle and squabble. These incidents are going on all day long. The banks are here also lined with Egrets, Blue Herons, Yellow- and Black-billed Spoonbills, whilst the trees shelter numbers of Night Herons, mostly in immature dress, waiting their turn when nightfall sends the others to roost.

The vast majority of the Pelican host have now scattered far and wide to seek other feeding grounds inland in waterholes, lakes and open swamps or all round the sea coast, in estuaries or sheltered bays or amongst the islands within the Barrier Reef, there to live and wait other opportunities to reproduce their kind.